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***BREAK FREE FROM THE SEA...:***  
**A STUDY OF EMPLOYING CARRIER AIRPOWER**  
**FROM THE BEACH**

BY

MAJOR STEPHEN P. LUXION

***A THESIS PRESENTED TO THE FACILTY OF THE SCHOOL OF  
ADVANCED AIRPOWER STUDIES***

FOR COMPLETION OF GRADUATION REQUIREMENTS

SCHOOL OF ADVANCED AIRPOWER STUDIES

AIR UNIVERSITY

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### *About the Author*

Major Stephen P. Luxion received his commission in 1984 from the U.S. Air Force Academy where he received his Bachelor of Science degree in Computer Science. His first assignment was as an information systems analyst for the Defense Communications Agency in the Pentagon. His overwhelming desire to fly pushed Major Luxion to attend Specialized Undergraduate Navigator Training where he graduated and was assigned to fly F-111s. Major Luxion's first assignment following F-111A training at Mt Home AFB, Idaho, was to the Strategic Air Command (SAC) where he flew the FB-111A for two years. In 1990, following his tour with SAC, he was reassigned to RAF Lakenheath in the United Kingdom to fly the F-111F. While assigned to the F-111F, he flew nearly 200 combat hours in DESERT STORM and OPERATION PROVIDE COMFORT. In 1992, he was reassigned as part of the initial instructor cadre for Cannon AFB's transition to the F-111F. While at Cannon, Major Luxion attended the USAF Fighter Weapons School. Following his four years at Cannon, Major Luxion had the unique opportunity for an exchange tour with the U.S. Navy, where he served as the Assistant Operations Officer for Carrier Air Wing THREE aboard the USS THEODORE ROOSEVELT, from 1995 to 1997. He also got the opportunity to fly 137 hours in the F-14A. In July 1996, Major Luxion returned to the Air Force to attend school at Air Command and Staff College, Maxwell AFB, Alabama. Following, his year at ACSC, he was selected to attend the Air Force's School of Advanced Airpower Studies (SAAS). Major Luxion's distinct

accomplishments include a Distinguished Flying Cross and four Air Medals. He has also been a Distinguished Graduate from Fighter Lead-in Training, USAF Fighter Weapons School, and Air Command and Staff College. He has been awarded Eighth Air Force's General Claire Chennault Award (for outstanding tactician) and Flight Commander of the Year. Following SAAS, Maj Luxion will serve as a strategist at 9th Air Force's Combat Plans Squadron. Following this staff assignment, he hopes to return to fly the F-15E.



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## *Abstract*

In 1992, the US Navy shifted its doctrinal concept of warfighting on the open seas to employing naval power in the littorals as part of a joint “sea-air-land” team. The Navy called its new doctrine “From the Sea....” For airpower, the service’s focus was on providing control and firepower to the littorals short of putting forces ashore.

Historical analysis of air operations in the 1990s and theoretical studies indicate that this doctrine fails to tap airpower’s full potential and indicates that the Navy needs to expand its doctrine to include an ability to conduct and sustain air operations “from the beach.” Interviews with carrier aviators, including a current Commander-in-Chief and former Deputy Coalition Forces Air Component Commander along with operational and academic study helped determine the impetus for conducting naval tactical air operations “from the beach,” the requirements to do it effectively, and the present shortfalls and limitations to such actions. Despite logistical impediments, the concept of carrier aircraft conducting operations “from the beach” can increase the power, flexibility, and efficiency of naval airpower. However, to take advantage of airpower’s latent potential, interoperability at the logistical support level must be improved. Expanding the “From the Sea...” doctrine to include the ability to conduct and sustain operations “from the beach,” when appropriate, will drive the necessary changes in training, logistics, and operations. In turn, this change would serve to improve our nation’s ability to conduct joint operations.

## Chapter 1

### Introduction

*Adherence to dogmas has destroyed more armies and cost more battles than anything in war.*

—J. F. C. Fuller

*In the development of air power, one has to look ahead and not backward and figure out what is going to happen, not too much what has happened.*

—Brigadier General William ‘Billy’ Mitchell, USAS

In 1994, Iraq President Saddam Hussein attempted to take advantage of the reduced number of coalition troops in the Persian Gulf region, a consequence of the downsizing and withdrawal of armed forces from the area following the 1990 Persian Gulf War. Hussein began moving his armor toward Saudi Arabia and Kuwait to gain leverage in an attempt to get sanctions against Iraq lifted. In response, the U.S. began a massive remobilization of forces into the region, as part of Operation VIGILANT WARRIOR, to deter further Iraqi aggression and halt Hussein’s forces should he attempt to cross into either Saudi Arabia or Kuwait.

The U.S. needed to deploy airpower rapidly into the region to accomplish this mission. Unfortunately, the nearest aircraft carrier was in the Mediterranean and would take up to one week to get into position in the Persian Gulf. Furthermore, during three to five of those days, carrier aviation assets would need air refueling just to reach Iraqi airspace. Further complicating these plans and operations, the requisite high-demand air-

refueling assets were also critical to getting other air assets into theater. Deputy Coalition Forces Air Component Commander (Deputy CFACC), Rear Admiral Joseph Prueher (now Admiral and US Commander-in-Chief Pacific Command (USPACOM)), identified the limited ability of carrier air assets to provide a halting force as the carrier transited around the Arabian Peninsula, through the Suez canal, the lower Red Sea, the Gulf of Aden, the Arabian Sea, the Gulf of Oman, and through the Straits of Hormuz.<sup>1</sup>

In order to overcome these limitations and make carrier tactical airpower (TACAIR) more productive and efficient in its employment, the Admiral attempted to move a portion of the air wing's TACAIR assets ashore and operate them from land bases. Despite pressing operational requirements, the Navy, politics, and interoperability issues restrained the Admiral, preventing a move that appeared to be in the best interest of the nation.<sup>2</sup> Although Admiral Prueher was unable to move carrier airpower ashore in the initial stages of Operation VIGILANT WARRIOR, he attempted to prove his concept when the next carrier arrived in theater. Again, interoperability difficulties in employing naval TACAIR assets from US Air Force (USAF) bases ashore continued to frustrate him.

In his book, *Hollow Victory: A Contrary View of the Gulf War*, Jeffrey Record states, "Desert Storm underscored the inherent limitations of carrier-based aviation as well as specific weaknesses in U.S. carrier operations."<sup>3</sup> Record asserts that because naval air is

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<sup>1</sup> Adm. Joseph W. Prueher, "Improving National TACAIR Interoperability," seminar lecture and discussion, School of Advanced Airpower Studies (SAAS), Air University, Maxwell AFB., AL., 17 September 1998.

<sup>2</sup> Ibid.

<sup>3</sup> Jeffery Record, *Hollow Victory: A Contrary View of the Gulf War*, (Washington D.C.: Brassey's, 1993), p. 116. Dr. Jeffery Record is a nationally recognized defense thinker now serving as a visiting Professor at the Air War College. He has served as a legislative assistant to Senator Sam Nunn, a columnist for the

compelled to operate from small decks it has to be able to withstand catapult launches and cable arrestments, thus limiting the size, range, and payload of the aircraft.<sup>4</sup> During Desert Storm, the Air Force greatly outgunned the Navy, despite the Navy's six carriers deployed in the theater. The Air Force "not only [had] a lot more aircraft of all types in the theater (1,400 versus 445 for the Navy)<sup>5</sup> but also [had] an even larger edge in offensive strike aircraft, heavy bombs, and precision-guided munitions" (PGMs).<sup>6</sup> Record further adds that since the Navy relies on its own organic air assets (traditionally 50-60 percent of its sorties) for fleet protection against surface, subsurface, and air threats, that tasking further reduces the number of strike aircraft available for joint or coalition action ashore.<sup>7</sup>

Operations in the Balkans show similar problems with carrier-based airpower's ability to generate striking power. Between 1993 and 1996 six different carriers took part in the enforcement of the UN mandated no-fly zone over Bosnia.<sup>8</sup> Even in this relatively benign environment where the carrier launched aircraft within 100 miles of Bosnian airspace the Navy generated only 10 percent (8,290 sorties) of total NATO sorties.<sup>9</sup> Remarkably, the Navy sortie production was outpaced by both the French Air Force

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*Baltimore Sun*, and a policy analyst at the Brookings Institution, the Institute for Foreign Policy Analysis, the Hudson Institute, and BDM International.

<sup>4</sup> Ibid.

<sup>5</sup> Ibid., citing a transcript of Department of Defense News Briefing by General Merrill A. McPeak, United States Air Force, Washington D.C., 15 March 1991, p. 18.

<sup>6</sup> Ibid., citing Vincent Thomas, "The Sea Services' Role in Desert Shield/Storm," *Sea Power*, September 1991, p.33; and Riley D. Mixon, "We Must Do Better," *Proceedings*, August 1991, pp. 38-39.

<sup>7</sup> Record, p. 116.

<sup>8</sup> Rebecca Grant, "The Carrier Myth," *Air Force Magazine*, Vol. 82, No 3 (March 1999): p. 28. Rebecca Grant is president of IRIS, a research organization in Arlington, VA. She previously worked for RAND Corp., in the Office of the Secretary of the Air Force, and for the Chief of Staff of the Air Force.

<sup>9</sup> Ibid.

(12,502 sorties) and the Royal Air Force (10,300 sorties).<sup>10</sup> During the same period, the USAF flew 31% of the total flights (24,153 sorties), nearly three times the Navy's production.<sup>11</sup>

The limitations of carrier-based firepower were further demonstrated during DELIBERATE FORCE operations against the Bosnian Serbs. In the two weeks of the August and September 1995 operation, carrier-based aviation delivered only 26 percent of the PGM hits against Bosnian Serb targets, even though the Navy was able to produce nearly 40 percent of the sorties.<sup>12</sup> Furthermore, not only was carrier-based airpower unable to produce the precision firepower of land-based aircraft, it was also unable to match its sortie rates. The Navy's 58 strike aircraft were able to produce 583 combat sorties over the 11-day operation. This generated a combat-sortie rate of 0.9 sorties per aircraft per day.<sup>13</sup> In comparison, land-based aircraft produced a combat-sortie rate of 1.5 sorties per aircraft per day with its 46 combat aircraft producing 777 sorties.<sup>14</sup>

The most recent experience gained during Operation DESERT FOX indicates that the ability of carriers to increase combat-sortie rates has changed little. Carrier Air Wing THREE (CVW-3), aboard the *USS Enterprise*, embarked 36 F/A-18s, 10 F-14s, and 6 EA-6Bs as its strike capability. With these 52 aircraft, CVW-3 was able to generate approximately 50 combat sorties per day for a 1.0 combat-sortie rate.

These operations highlight the weaknesses of carrier-based versus land-based airpower without considering any of the many advantages naval air brings to a nation.

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<sup>10</sup> Ibid.

<sup>11</sup> Ibid.

<sup>12</sup> Ibid.

<sup>13</sup> Ibid., p. 29.

<sup>14</sup> Ibid.

This analysis, however, does beg the question: Are there benefits in moving carrier aviation assets ashore? Air operations during DESERT STORM, VIGILANT WARRIOR, DELIBERATE FORCE and DESERT FOX indicate that there is an operational requirement to move air assets ashore. During VIGILANT WARRIOR, the need was to generate sorties to deter and defend against possible Iraqi aggression until the carrier was in position to conduct routine flight operations. In the other examples, even with carriers in place, limitations in payload, range, and sortie rates indicated there might indeed be times when it is advantageous to move carrier air assets ashore. Additionally, the U.S. no longer has the air assets available within the entire Air Force and Navy to match the DESERT STORM force. One service can no longer do it all. It will take a competent joint effort, centered on the most efficient use of available air assets, to protect US interests around the world. The purpose of this paper is to examine one concept to increase interoperability and efficiency of US TACAIR at the operational level of war. Specifically, it will investigate what impetus exists for conducting naval TACAIR missions “from the beach,” what is required to do it effectively, and what are the present shortfalls and limitations to such actions.

## **Methodology**

In order to investigate the concept of employing carrier airpower “from the beach,” the analysis will begin with a review of airpower characteristics, tenets, and doctrine as they relate to employing carrier air from shore bases. Subsequent chapters will include information gathered from interviews that were conducted with carrier aviators to explore the questions of when carrier air should be employed from bases ashore and how to best do it, including anticipated problems and limitations.



The purpose of this study is not to attack Navy carriers or carrier aviation. The author appreciates that carrier aviation is a necessary and critical component of national security and the protection of our national interests worldwide. Naval Expeditionary Forces are forward deployed at all times and can respond quickly to any crisis. They provide the nation “unobtrusive forward presence which may be intensified or withdrawn as required on short notice.”<sup>15</sup> Perhaps the greatest advantage of naval airpower is that it can use the international precedent of freedom of the seas to guarantee legal access to the territorial waters of coastal countries around the world.<sup>16</sup> Thus, the Navy is “unrestricted by the need for transit, [basing] or overflight approval from foreign governments in order to enter the scene of action.”<sup>17</sup> As further described in the Navy’s White Paper “...From the Sea:”

The Navy and Marine Corps operate forward to project a positive American image, build foundations for viable coalitions, enhance diplomatic contacts, reassure friends, and demonstrate U.S. power and resolve. ... Naval Forces will be prepared to fight promptly and effectively, but they will serve in an equally valuable way [by] engaging day-to-day as peacekeepers in the defense of American interests.<sup>18</sup>

Carrier airpower provides the nation with core competencies that the other services cannot match. Clearly, naval airpower projected from the decks of US aircraft carriers needs to remain a vital part of the nation’s capabilities.

For the purpose of this thesis, it is assumed that land bases are available and operations will be allowed from them. This analysis will not consider the budget and

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<sup>15</sup> Department of the Navy White Paper, “...From the Sea: Preparing the Naval Service for the 21<sup>st</sup> Century,” September 1992, pp. 2-3; on-line, Internet, 9 December 1998, available from <http://ndcweb.navy.mil/htdocs/fts.html>.

<sup>16</sup> Ibid.

<sup>17</sup> Ibid.

<sup>18</sup> Ibid.

force requirement battles that could result from discussions or actions that involve operating carrier aircraft from land bases. It will not look at various force structures or attempt to determine if operations are better preformed by USAF or USN assets. Instead, this thesis will focus on improving the operational efficiency and interoperability of this nation's tactical air assets. It assumes that this is in the best interest of the nation and that the services will work together and modify their standard operating procedures to achieve greater interoperability, efficiency, and synergy for the nation as a whole.

Today, the U.S. faces reduced numbers of aviation assets to cover more contingencies than it has ever faced. In order to fulfill the large number of worldwide missions being given to the US military, every effort must be made to increase interoperability between airpower assets in the US Navy and the US Air Force.

The notion of moving carrier aircraft ashore offers the nation a means to achieve a more efficient and synergistic application of its airpower assets. The concept of carrier airpower employed from bases ashore is defined as a doctrinal capability of the Navy to provide the Joint or Coalition Force Air Component Commander (for simplicity JFACC will be used to represent both) with aircraft from the carrier for operations from inland bases. This concept is meant to go beyond the ad hoc method that is currently in place whereby the JFACC, based on the Carrier Battle Group, can sometimes place NAVAIR forces ashore and at other times he cannot. The concept would provide the JFACC a doctrinal option to operate carrier aircraft from land bases. Finally, this definition does not intend to ignore the strategic and operational considerations of the JFACC, Joint Force Military Component Commander (JFMCC), Joint Force Commander (JFC) or National Command Authority that are pertinent to such a decision.

Chapter 2 grounds the study of employing carrier airpower “from the beach” on current doctrine, core characteristics and tenets of airpower. These airpower tenets serve as the cornerstone for the examination in Chapter 3 of the impetus for moving NAVAIR operations ashore. Chapter 4 develops considerations for the numbers and types of aircraft that should be moved ashore. Chapter 5 addresses the critical consideration of how to command and control these forces ashore. Chapter 6 considers the typical hamstrings to these operations and their concurrent logistical requirements. Here interoperability, logistics and maintenance issues are considered. JFC and JFACC support to the fleet when carrier assets are moved ashore are laid out in Chapter 7. Chapter 8 provides synthesis, conclusions and implications of the study to doctrine, operations, logistics and training.

## Chapter 2

### Airpower's Potential Strengths and Synergies

*The flexibility of an air force is indeed one of its dominant characteristics.... Given centralized control of air forces, this flexibility brings with it an immense power of concentration which is unequaled in any other form of warfare.*

—Air Marshal Sir Arthur Tedder

*The most important thing is to have a flexible approach. ... The truth is no one knows exactly what air fighting will be like in the future. We can't say anything will stay as it is, but we also can't be certain the future will conform to particular theories, which so often, between the wars, have proved wrong.*

Brigadier General Robin Olds, USAF

### Naval and Joint Airpower Doctrine

Naval doctrine is very limited on the subject of airpower. *NDP 3 Naval Operations*, remains unpublished and not available for review due to disagreements as to what constitutes operational doctrine. Individual carrier air wings are left to develop their own standard tactics, techniques, and procedures called TACNOTES. Although the Navy has attempted to standardize these, each carrier air wing's TACNOTES are different from the next and are subject to change at the discretion of the Air Wing Commander (CAG).

Joint doctrine is only marginally better in discussing the specifics of joint airpower doctrine. However, joint doctrine does discuss the function of the JFACC and the importance of centralized command and control of airpower assets. Still, joint doctrine is

very land-centric and focuses more on the broader aspects of operational art, as well as joint and multinational operations.

Airpower gives leaders the unique characteristics of speed, flexibility, global reach and perspective.<sup>19</sup> Due to these advantages, airpower is “intrinsically different from either land or sea power” and therefore must be guided by different axioms than those of surface forces.<sup>20</sup> Certain of these axioms or tenets of airpower are relevant to the study of breaking free from the Navy’s concept of “From the Sea...” to the employment of carrier airpower “from the beach.” Such a move should be evaluated against some basic universal tenets that relate to airpower in general, to see if employing airpower “from the beach” serves these tenets. Before investigating the impetus for employing carrier aircraft from inland bases, a review of some universal tenets of airpower is required.

## **Tenets of Airpower**

### **Centralized Control and Decentralized Execution**

*Centralized Control by an airman with broad strategic and/or theater perspective and decentralized execution by subordinate commanders to maintain span of control and foster flexibility and initiative is critical to force effectiveness.*<sup>21</sup> To be most effective, airpower cannot be limited by lines on the ground. Surface warfare is considerably more linear relative to air warfare. Surface commanders, although concerned with deep operations, are more concerned tactically with the enemy and obstacles to their

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<sup>19</sup> Department of the Air Force, *Global Engagement: A Vision for the 21<sup>st</sup> Century Air Force*, (Washington D.C.: Department of the Air Force), p. 9.

<sup>20</sup> Air Force Doctrine Document (AFDD) 1, *Air Force Basic Doctrine*, (Maxwell AFB, AL: Headquarters Air Force Doctrine Center, September 1997), p. 22

<sup>21</sup> *Ibid.*, p. 23.

immediate front and the lines separating their actions from those of commanders to their left and right.<sup>22</sup> The inherent speed, flexibility and range of airpower along with its ability to strike at all three levels of war (tactical, operational, and strategic) in parallel requires an airman to think in much broader terms.<sup>23</sup>

Centralized control of airpower is critical. “The lesson is clear: attempts to fragment the control and planning of air...power will ultimately cost blood and treasure by diverting effort and impact.”<sup>24</sup> This lesson has been learned and relearned since World War I when airmen first realized centralized control was necessary for the effective employment of airpower. World War II demonstrated both effective and ineffective uses of airpower. In the North African campaign of 1942, aircraft were initially divided among the individual ground commanders with devastating results.<sup>25</sup> On the other hand, General George Kenney’s centralized control of air assets led to their effective use in the South Pacific.<sup>26</sup> The lack of centralized control resulted in a clumsy application of airpower in both Korea and Vietnam. Conversely, centrally commanded air operations by the CFACC during Operation Desert Storm, although not perfect, again showed the importance of centralized command.

Just as centralized command is necessary to provide a broad perspective, decentralized execution is just as necessary to employ airpower properly. For example, during Desert Storm 2,000-3,000 sorties were being flown everyday. Decentralized

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<sup>22</sup> Colonel Phillip S. Meilinger, *10 Propositions Regarding Air Power*, (Air Force History and Museums Program, 1995), pp. 50-51.

<sup>23</sup> Ibid., pp. 34, and 52.

<sup>24</sup> AFDD-1, p. 23.

<sup>25</sup> Meilinger, p. 54.

<sup>26</sup> Ibid.

execution, through able subordinate commanders, allows for the proper span of control, flexibility, and initiative to exercise so much airpower effectively and efficiently.

## **Offensive**

*Airpower is inherently offensive.* On the ground, land can be occupied, fortifications and defenses built, defenders dug-in, and interior lines occupied to give defenders the advantage over those on the attack since the attackers have to overcome these strongholds.<sup>27</sup> Clausewitz writes that “defense is the stronger form of war...” but goes on to remind readers that only negative purposes (denying the enemy what he wants), can be achieved while on the defense and such actions must be abandoned for the offensive when one’s forces are strong enough in order to achieve a positive purpose (get what one wants).<sup>28</sup>

Airpower’s inherent speed, flexibility, and range matched with the vastness of airspace allow airpower an infinite number of approaches of attack on a large number of enemy targets.<sup>29</sup> It would be virtually impossible to defend all possible routes of access and targets from an air attack.<sup>30</sup> Furthermore, even if it were possible for an adversary to protect every access route and target, there is still no guarantee that he could prevent all aircraft from getting through his defenses and striking their targets.<sup>31</sup> Considering all the possible avenues of attack against a variety of targets and the cost of attempting to defend all these, the advantage goes to the attacker who can initiate action, determine the routes

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<sup>27</sup> Ibid., p. 14.

<sup>28</sup> Von Clausewitz, Book Six, Chapter One, p. 358.

<sup>29</sup> Meilinger, p. 15.

<sup>30</sup> Ibid.

<sup>31</sup> Ibid.

and targets that meet his level of risk and strategy, and thus place the enemy at a disadvantage and force him to react.

In summary, the speed, range and flexibility of air power grant it ubiquity, and this in turn imbues it with an offensive capability. Because success in war is generally attained while on the offensive, the adage, “best defense is a good offense,” is almost always true in air war.<sup>32</sup>

This does not warrant an irrational belief in the offense “despite readily available evidence to the contrary” as presented by Major John Carter in his paper, “Airpower and the Cult of the Offensive.”<sup>33</sup> While airpower, with careful analysis of the situation, is inherently offensive, it must include defensive capabilities. Still, airpower achieves its greatest effects when it brings the fight to the enemy.

### **Flexible and Versatile**

*Air power is flexible and versatile.*<sup>34</sup> “Flexibility allows air...forces to exploit mass and maneuver to a far greater extent than surface forces.”<sup>35</sup> Operationally, aircraft can be quickly shifted from one operation to another. During DESERT STORM for example, A-10s, typically close-air-support aircraft, were used on many interdiction missions.<sup>36</sup> F-111F’s, typically deep-interdiction aircraft, were used very effectively to destroy tanks.<sup>37</sup> Furthermore, the B-52, typically considered a strategic bomber, flew close air

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<sup>32</sup> Ibid., p. 19.

<sup>33</sup> Maj John R. Carter, “Airpower and the Cult of the Offensive,” *Cadre Paper* (Maxwell AFB., AL.: Air University Press, October 1998), p. 3. Maj Carter is an A-10 pilot, graduate of the USAF Weapon School where he was awarded the Robbie Risner Award for the year’s top graduate. He is also a graduate of the School of Advanced Air Power Studies at Maxwell AFB, AL.

<sup>34</sup> AFDD-1, p. 23.

<sup>35</sup> Ibid.

<sup>36</sup> Ibid.

<sup>37</sup> Ibid.



support for the Marine Corps.<sup>38</sup> “Versatility in air...power stems from the fact that it can be employed equally effectively at the strategic, operational, and tactical levels of warfare,” in parallel, creating multiple crises so quickly, at all levels, that the enemy cannot effectively respond to them all.<sup>39</sup> Geographical barriers on the ground typically cause ground operations to proceed sequentially from one operational objective to another. “The enemy can alleviate the effects of serial attack by dispersal over time, increasing the defenses of targets that are likely to be attacked, concentrating his resources to repair damage to single targets, and conducting counteroffensives.”<sup>40</sup> The inherent versatility of airpower allows it to attack multiple targets and objectives in parallel, thereby denying the enemy the ability to respond effectively and “the greater the percentage of targets hit in a single blow, the more nearly impossible is [the enemy’s response].”<sup>41</sup>

## **Persistence**

*“Air...power is uniquely suited to persistent operations.”<sup>42</sup>*

Unlike surface power, air...power’s inherent exceptional speed and range allows its forces to visit and revisit wide ranges of targets nearly at will. Air...power does not have to occupy terrain or remain constantly in proximity to areas of operations to bring force upon them.

Persistence ensures that the initiative remains in friendly hands and not the enemy’s. Furthermore, persistence is required to overcome the enemy’s strength, ingenuity, and flexibility in adapting to offensive operations against him. “Given sufficient time, even

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<sup>38</sup> Ibid., p. 24.

<sup>39</sup> Ibid.

<sup>40</sup> Colonel John A Warden III, “The Enemy as a System,” *Operational Forces*, (Maxwell AFB.: Air Command and Staff College, 1998), p. 21.

<sup>41</sup> Ibid.

the most devastating strategic effects can be circumvented by resourceful enemies; the goal is to keep pressure on and not allow the enemy that time.”<sup>43</sup> It is critical for the commander to “resist pressures to divert resources to other efforts, unless such diversions are vital to attaining theater goals or to the survival of an element of the joint force.”<sup>44</sup>

## **Concentration**

*The application of airpower must achieve a concentration of purpose.*<sup>45</sup> Airpower’s unique speed, range, and flexibility allow air assets to be brought together in a concentrated force to overwhelm the enemy and achieve dramatic effects. Airpower is so effective that airmen must be on-guard to diversion of high-demand air assets.<sup>46</sup> Diversion of these air resources may risk “(1) failing to achieve operational-level objectives; (2) delaying or diminishing the attainment of decisive effects; and (3) increasing the attrition rate of air forces consequently, risking defeat in detail.”<sup>47</sup> Air assets should be employed in concentration to avoid these risks and achieve airpower’s most overwhelming effects.

## **Priority**

*“Air...operations must be prioritized.”*<sup>48</sup> Airpower is so effective because of its speed, range, flexibility and versatility that it will be in very high demand.<sup>49</sup> The tenets

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<sup>42</sup> AFDD-1, p. 25.

<sup>43</sup> Ibid., p. 26

<sup>44</sup> Ibid.

<sup>45</sup> Ibid.

<sup>46</sup> Ibid.

<sup>47</sup> Ibid.

<sup>48</sup> Ibid.

<sup>49</sup> Ibid.

of persistence and concentration further require that the highest levels of command establish priorities. The JFC and the JFACC must consider all the prioritized requirements of the sea and land component commanders and establish air priorities to support (1) the overall joint campaign, (2) air operations, and (3) the battle at hand.<sup>50</sup>

The analysis of the question of moving from the Navy's doctrine of "From the Sea..." to one including NAVAIR operations "from the beach" will include an analysis of these basic airpower tenets. Specifically, such a change in doctrine should, on the balance, improve operations in respect to one or more of these tenets of airpower: centralized control and decentralized execution, offensiveness, flexibility and versatility, persistence, concentration, and prioritization. Thus, these tenets serve as a starting point for determining the impetus for employing carrier assets from inland bases.

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<sup>50</sup> Ibid.

## Chapter 3

### Impetus for Operations “From the Beach”

*Airpower has become predominant, both as a deterrent to war, and—in the eventuality of war—as the devastating force to destroy an enemy’s potential and fatally undermine his will to wage war.*

—General Omar Bradley

To question over 250 years of tradition and move from the Navy’s doctrine of “From the Sea...” to one that expands this doctrine to include operations “from the beach” requires some justification. Anyone who has seen air operations from the flight deck of a US aircraft carrier is amazed with the choreography of planes, men, bombs, and missiles as aircraft launch and recover simultaneously. The US Navy is very good at orchestrating air operations from its carriers, the best in the world; certainly no other nation’s navy can match and sustain the sortie rates and firepower US naval carriers can produce. The purpose here is to explore whether the US Navy should also have a capability to employ its carrier airpower from bases ashore.

Although carrier aviation does provide many benefits to the nation and the US Navy is tops in the field, there are definite limitations to carrier air as shown by the examples presented in Chapter 1. In the first example, as the carrier transited from the Mediterranean to the Persian Gulf, its aircraft were out of range of Iraqi airspace without help from limited USAF air-refueling assets. The subsequent examples showed that

limitations of carrier operations prevented the US Navy from coming close to producing the offensive-sortie rates, heavy-bombs expenditures, and precision-guided weapons employment generated by land-based USAF assets. Improved range and operational efficiency may represent two possible reasons to employ NAVAIR from land bases. Sortie rates and weapons loads may also be motives for moving carrier air assets ashore in some circumstances.

## **Range**

Perhaps the most obvious argument for moving air assets off the decks of carriers to basing ashore, is range. Crises do not always wait for a carrier to arrive before boiling over. This is just what happened in VIGILANT WARRIOR. Saddam Hussein began moving his forces south toward Saudi Arabia and Kuwait when only limited coalition forces were in place and the nearest carrier was in the Mediterranean, a week's transit away. The carrier's aircraft, however, were well within ferry range of bases in region where they could have been forward-based for operations against Iraqi forces. Admiral Prueher attempted to do just that to enhance air operations against Saddam, instead of having aircraft sitting idly onboard a carrier while it was out of range of the crisis.<sup>51</sup>

One of the Navy's stated purposes of forward-deployed Naval Expeditionary Forces is its ability to respond swiftly to any crisis in order to shape the situation favorable to US interests.<sup>52</sup> Navy doctrine, however, emphasizes that it can strike quickly "from the sea...short of putting forces ashore."<sup>53</sup> While this may be advantageous in most cases, it is clearly not the best solution for all situations. The inherent speed advantage of aircraft

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<sup>51</sup> Admiral Prueher SAAS visit.

<sup>52</sup> "Forward From the Sea...", pp. 1 and 3.

over an aircraft carrier would allow Navy air assets to rush to the scene of a crisis. They could be available to shape the situation much sooner than relying on the top speed of the carrier to bring them into range. Clearly, other contextual and operational considerations must be weighed (many will be discussed later), however, it does not change the fact that the inherent speed of aircraft can place it on-scene sooner than if it remains on-board the carrier. Furthermore, the constant state of readiness of forward-deployed carrier aviation would normally allow it to be ready to react sooner than CONUS-based USAF assets.

A similar situation occurs when the carrier is as close as it can get to the shoreline (based on sovereignty, draft, threat, or any number of other reasons) but the enemy is beyond the combat radius of carrier aircraft while secure land-bases exist closer to the targets. Navy TACAIR can be air refueled to extend their combat radius but this reduces operational efficiency (discussed later) and still does not diminish the other advantages of being closer to the target.

Additionally, increases in range can be realized by moving carrier-based aircraft ashore because the lower fuel reserve is required for land versus carrier operations.<sup>54</sup> For example, during daytime operations, reduced fuel reserves allow approximately 15 minutes more flight time and an increase of 50 nautical miles to the combat radius of an F/A-18.<sup>55</sup> Due to the higher fuel reserve required for nighttime carrier operations, the advantage of conducting operations is even more remarkable. The combat radius of an

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<sup>53</sup> Ibid., p. 7

<sup>54</sup> LCDR Robert Boyer, Operations Officer and former Maintenance Officer for VFA-83, interviewed by author, 22 March 1999.

<sup>55</sup> Ibid., Fuel reserves for an F/A-18 conducting daytime carrier operations are 3,500 pounds. Fuel reserves for daytime land operations are 2,000 pounds. The net gain of 1,500 pounds of fuel by operating “from the beach” converts to approximately 15 minutes more flight time and 50 nautical miles more combat radius.

F/A-18 is increased by as much as 75-100 nautical miles.<sup>56</sup> Indeed, carrier aircraft can attack deeper targets simply by operating “from the beach.”

Moving naval TACAIR to land bases, closer to targets, offers the possibility of increasing the offensive power, flexibility and versatility, persistence, and prioritization of naval airpower. Offensive power can be increased as range is reduced because stations that are used for external fuel-tanks to provide aircraft the endurance to reach long-range targets can instead be used for additional munitions. Flexibility and versatility may likewise be improved through land basing closer to the enemy because a larger variety of targets can be attacked within the combat radius of a particular aircraft. Hence, targeting becomes less constrained by range. Additionally, persistence is improved due to the reduced transit time between launch, attack, and recovery. The reduced range allows quicker aircraft turn around. Prioritization is improved in two ways. First, since aircraft are less limited by range, higher-priority targets, as determined by JFC objectives, may be within range of attack by land-based naval assets versus the targets that are accessible from the carrier-based airpower. Furthermore, naval aircraft are more ‘out-of-sight, out-of-mind’ when they are based ashore and, therefore, are less likely to be diverted to support naval priorities unless these missions are deemed more important by the JFACC or the JFC. Overall, carrier aircraft based on land, closer to enemy targets, can increase the utility of naval airpower.

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<sup>56</sup> Ibid., Fuel reserves for an F/A-18 conducting nighttime carrier operations are 4,500 pounds. Fuel reserves for nighttime land operations are 2,000-2,500 pounds based on the squadron. The net gain of 2,000-2,500 pounds of fuel by operating “from the beach” results in approximately 20-30 more minutes flight time and 75-100 nautical miles more combat radius.

## Sortie Rates

Operations ashore also present the possibility of increasing sortie rates. The process of producing sorties from an aircraft carrier is different from that used to generate land-based sorties. The latter have the huge advantage of space. A typical airbase has one or more runways, a series of taxiways, arming areas, parking ramps, maintenance hangers and facilities, POL storage areas and other facilities all on an area of several square miles. Carrier aviation does not have this luxury. The flight deck of a modern US nuclear carrier is typically 1092 feet long by 252 feet wide.<sup>57</sup> In this relatively tiny space, and in the smaller hanger deck below, all the same operations required ashore to launch and recover aircraft must be accomplished. In order to achieve this, the Navy has to use equipment such as steam catapults and arresting equipment and, more importantly, unique procedures for handling, maintaining, loading, launching and recovering aircraft while at sea.

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<sup>57</sup> David Donald and Jon Lake, ed. *US Navy & Marine Corps Air Power Directory*, (Westport, CT.: Airtime Publishing, 1996), p.18.





**Figure 1. US Nuclear Carrier at Sea**

The Navy has developed a system to execute this process many times a day known as 'cyclic operations'. A typical cycle starts as the carrier turns into the wind and commences launching of that event's aircraft from usually three to four of its catapults.

Meanwhile, returning aircraft marshal overhead while they wait for the landing area to be cleared of launching aircraft. When the landing area is cleared, the two waist catapults are covered and aircraft begin recovering on the angled landing area while simultaneous launches continue from the two bow catapults. As aircraft land they are moved out of the landing area, dearmed, and parked or ‘spotted’ so that they do not interfere with the rest of the launching and recovering aircraft. This results in the aircraft being spotted very tightly together from bow to amidships. Once all aircraft land, aircraft maintainers and aircraft handlers refuel, repair, reload, and respot the aircraft for the next launch. Aircraft usually need to be respotted aft in order to clear the catapult area and make room for the next launch in its proper sequence. Aircrew preflight the aircraft and the process starts all over again. Cycle times typically vary between 1 hour and 1 hour 30 minutes,<sup>58</sup> with most carriers operating one-hour thirty-minute cycles.<sup>59</sup>



**Figure 2. Launch From the *USS George Washington***

The process of continually churning-out sorties from the deck of a carrier is a complex process and it is not very flexible. An aircraft that is quickly ready for takeoff

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<sup>58</sup> Based on cycle times of CVW-3 aboard *USS Theodore Roosevelt*, April 1996 through May 1997.

cannot usually be launched immediately. It may be stuck behind other planes, the carrier may not be pointed into the wind, or it may not have enough fuel to launch early and still have the required landing fuel reserves. Likewise, an airplane delayed for maintenance probably will not be able to takeoff. Recovery operations may prevent the repaired aircraft from taxiing to the catapults. To overcome lost sorties due to maintenance delays, the air wing will have a dedicated spare by airframe type for each cycle. Although this procedure helps prevent lost sorties, the overall sortie-generation rate for the air wing is further reduced. The requirement to have a spare for every airframe every launch, reduces the number of possible sorties that can be flown.



**Figure 3. *USS Constellation* Aircraft Packed On Board**

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<sup>59</sup> Most Air Wings use the typical 1-hour, 30-minute (1+30) cycle. It provides an excellent tradeoff between mission requirements, fuel requirements, maintenance requirements, and the ship handler's requirements to respot the flight deck for the following launch.

Another type of operation, called “flex deck” operations, is possible. However, CDR John T. DuGene, a former carrier ‘Air Boss’<sup>60</sup>, expressed the opinion that since this type of operation is not practiced it would probably not be used today.<sup>61</sup> Flex-deck operations are very labor intensive and attempt to keep the landing zone and launching areas clear at all time so that continuous operations can occur. To keep the deck clear, either fewer aircraft can be aboard or more aircraft kept below in the hanger decks; both of these options hurt overall sortie-generation rates.

Due to the nature of these cyclic operations, carriers cannot match the sortie-generation rates of land-based aircraft. In contrast, a land-based aircraft has the advantage that it can usually takeoff as soon as it is ready, fly its mission, return and recover immediately, to recycle and launch again.

Land-basing naval-air units offers the possibility of increased sortie rates which could, in-turn, increase their overall offensive capability, flexibility and versatility, persistence, and ability to concentrate. Additionally, as previously suggested, if bases are available closer to the target area than the carrier can position itself, sortie rates could be increased further due to the reduced range.

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<sup>60</sup> An Air Boss is responsible for all air operations on and in the immediate vicinity of the carrier. Specifically, he is responsible for all landing and launch operations, all aircraft in the air around the carrier, all movement of aircraft on the flight and hanger decks, and all the personnel on the flight and hanger decks responsible for these operations.

<sup>61</sup> CDR John T. DuGene, former Air Boss *USS Lincoln*, interviewed by author during visit to the Naval War College, Newport, RI, 15 Jan 99.

## Weapons Load

A carrier's tactical aircraft are not weapons-load (weapon weight) limited for the catapult shot.<sup>62</sup> Therefore, given that a target is an equal distance from the carrier as it is from a land base, an F/A-18C can take off with the same weapons load.<sup>63</sup>

The same F/A-18C, however, is indirectly restricted in its weapons load if it has to return to the carrier with its munitions unexpended. Each type of airplane has a landing weight limit. For example, a typical sortie with self-protection air-to-air missiles and anti-tank Maverick missiles would have 3,000-5,000 pounds more weight if the pilot did not employ these weapons during the flight. To compensate, the pilot must either dump or burn an equal amount of fuel, or dump the weapons in the water before recovery.<sup>64</sup> This fuel is a necessary safety reserve during recovery. It allows the pilot additional opportunities to successfully land aboard the carrier before the jet has to divert to a field ashore or, if out of range of land, take the crash barrier.<sup>65</sup> It is normal for the JFACC to task carrier air assets for presence and protection missions in a no-fly zone where weapons are not normally employed but brought back aboard the ship. In order to do this, the Navy will not arm its aircraft 'to the teeth.' Instead, the planes will fly with what is called a 'recoverable load' (lighter weapons load) to provide pilots with a safety

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<sup>62</sup> LCDR John Stamos, former F/A-18 pilot, maintenance officer, and operations officer for VFA-37, interviewed by author during visit to the Naval Development Center, Newport, RI, 15-16 Jan 99.

<sup>63</sup> Ibid.

<sup>64</sup> It is typical for a pilot to bring unexpended weapons back to the ship when flying presence-type missions like No-Fly Zone operations over Iraq or Bosnia. These weapons are necessary for operations if violations occur while flying in protection of these areas, but on most sorties, there is no need to employ weapons. Dumping these precision munitions into the water to recover is an expensive proposition if all sorties returning from presence missions had to do so.

<sup>65</sup> The crash barrier is a large webbed net that flight deck personnel can erect in the landing area to trap an aircraft that cannot safely land aboard the carrier by other means. It eliminates the need for the pilot to catch the arrestment cable with his hook. Flight deck personnel erect the crash barrier for various

margin for recovery.<sup>66</sup> Although this may not be the most optimal offensive load for combat, it still has a lot of punch and air wings have deemed it adequate for such missions.<sup>67</sup>



**Figure 4. F/A-18 Ready for Action**

Therefore, weapons load may or may not be a motive for employing naval aircraft ashore. On operations where weapons expenditure is expected, launch and recovery limits are not cause for moving naval aircraft ashore. However, when operations include numerous flights where expensive weapons are not employed but instead brought back to the ship for the next flight, recovery limits causing reduced operational loads may be reason to operate naval airpower from shore-bases. Furthermore, as previously stated, increasing an aircraft's weapons load, because of the reduced range to the target, is another possible advantage of moving carrier assets ashore.

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emergencies, only one of which is a pilot so low on fuel he cannot divert to a land base and is having difficulty recovering normally.

<sup>66</sup> LCDR Stamos interview.

<sup>67</sup> Ibid.

## **Operational Efficiency**

Operational efficiency includes any number of things that influence airpower's overall effectiveness. These include the overall air-planning process, synergies achieved by the efficient and coordinated application of joint airpower, and many of the items already discussed above.

Developing an Air Tasking Order (ATO) for theater air operations is a very complicated process. The carrier's cyclic operations further complicate and constrain this planning. In order to concentrate forces and provide persistent air operations, planners must build the ATO around the carriers cycle times.<sup>68</sup> Due to limited resources within the theater, ATO developers need carrier air assets to help fill all the demands for airpower. As indicated by DESERT STORM's statistics, in major operations, land-based assets provide the preponderance of offensive sorties. If carrier air assets were moved ashore, ATO production could be more flexible and less constrained by the cycles of the carrier.

Air refueling is another area of operational efficiency that relates to both range and sortie rates. Air-refueling aircraft are typically limited, high-demand assets critical to air operations. The US Navy and the US Air Force use two different methods to refuel their aircraft. The USN uses a probe and drogue method whereby pilots fly an air-refueling probe on their aircraft into a free-flying basket that trails behind the air refueling aircraft. Most Air Force aircraft use an air refueling boom and receptacle method, where the pilot places his aircraft in position under the rear of the refueling aircraft. A boom operator,

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<sup>68</sup> Based on feedback and liaison with the ATO planning cell in Vicenza, Italy, for Operation DELIBERATE GUARD, January 1997 and the author's personal experience as a Naval Liaison Officer for the Joint Task Force South West Asia ATO planning cell in Eskan Village, Saudi Arabia, for Operation SOUTHERN WATCH, March 1997.

aboard the air refueling aircraft, can plug the boom into the receiver's air-refueling receptacle.



**Figure 5. USN F/A-18 in the Basket**

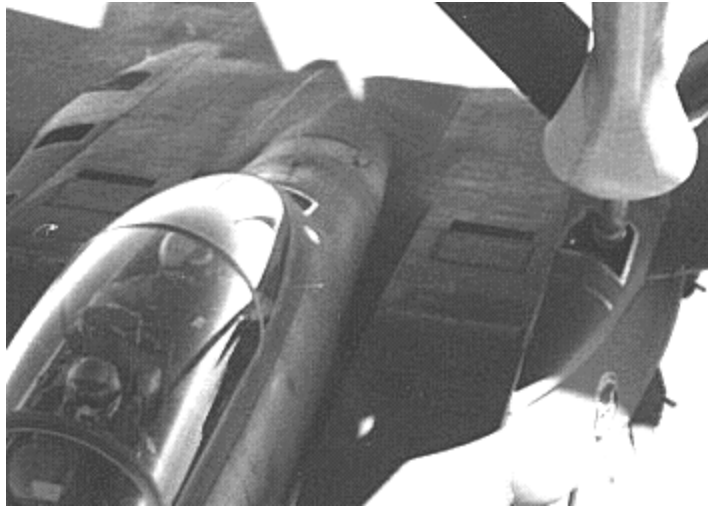
These two air-refueling methods were developed because of unique requirements in each service. The Navy needs the drogue system because it is smaller and they can mount it on carrier aircraft used to refuel other airplanes while they are out of range of USAF tankers. Furthermore, the Navy uses drogue-equipped aircraft as a safety measure on every recovery, just in case a pilot is low on fuel because he or she has had difficulties in landing aboard.<sup>69</sup> The limitation of the drogue method is the refueling rate is relatively slow at approximately 1,500 pounds per minute. This is unacceptable for US Air Force aircraft. The boom probe method can transfer fuel at a much quicker rate, typically

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<sup>69</sup> CVW-3 and *USS Theodore Roosevelt* standard operating procedures called for one S-3, with 3,000 pounds of fuel to give to serve as the recovery tanker during daylight hours and good weather, and two S-3s with 3,000 pounds of give, each, for night or inclement weather operations.



between 4,500-7,000 pounds per minute which is necessary to refuel large aircraft like the B-52 or large strike packages of many aircraft.



**Figure 6. USAF F-15E on the Boom**

The USAF is primarily responsible for the air-refueling mission. KC-135s are capable of only drogue refueling or boom refueling. They cannot do both, and cannot switch methods once airborne. If the KC-135 is going to be refueling naval (probe-equipped) aircraft a hose and basket must be attached to the end of the boom before takeoff. KC-10s do not have the same problem, for they are equipped with a separate basket and boom.

Operations are hampered when naval aircraft need air refueling to attack targets and return to the carrier. First, organic refueling assets aboard the carrier, S-3 Vikings, are relatively slow, operating at cruise speeds of approximately 210 knots, as compared to their tactical counterparts from the carrier which typically cruise between 350-450 knots. Furthermore, the altitudes at which each efficiently fly are very different. In addition, S-3s do not have a lot of fuel to offload. A typical S-3 tanker sortie may be able to pass

6,000 pounds of fuel.<sup>70</sup> Furthermore, the S-3 also has missions other than refueling: Sea Surveillance and Control, Surface Warfare, Undersurface Warfare, Electronic Surveillance, and Strike Warfare. All this limits the S-3's ability to provide refueling support to strike packages operating against long-range targets.

Operations are also hampered by the slow rates at which naval aircraft receive fuel. Even with an Air Force tanker loaded with plenty of fuel to offload, the problem is time. Naval strike-packages have to be limited in size, or use multiple tankers (multiple baskets) to get the strikers refueled, to their targets, and back to the carrier in time to meet their cycle land time.<sup>71</sup> When multiple tankers are used, the amount of fuel offloaded is only a fraction of what the tanker has available. So, the tankers, especially KC-135s, must burn fuel and wait until the carrier launches another strike in the next cycle or two; this is not a very efficient use of limited tanker assets. Another option is to keep the strike aircraft airborne and give them both pre-strike and post-strike air refueling then land them with the next cycle's aircraft. But this too hurts operational efficiency in that these aircraft are not being recovered and reloaded for another mission, instead they are holding for the next recovery time, thus reducing the number of sorties that can be generated.

Operational inefficiencies decrease the offensiveness, flexibility and versatility, persistence, concentration and prioritization of airpower. Means to decrease these inefficiencies should be explored. Moving aircraft ashore may be one way to do this. Additionally, decreasing the range to the targets and allowing aircraft to recover

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<sup>70</sup> Based on S-3 fuel give amounts from VS-22 aboard *USS Theodore Roosevelt* cruise, November 1996-May 1997.

<sup>71</sup> This was a continual problem that Carrier Air Wing THREE (CVW-3) faced when attempting to cover targets beyond the coast in Iraq's southern No-Fly Zone, March 1997.

immediately when returning to base can reduce air-refueling inefficiencies. Employing naval assets from forward land-bases introduces increased flexibility in planning and operations by not tying it to the constraints of the carrier's cyclic operations.

Command and control and logistical issues still need to be examined to determine the overall operational efficiency of employing carrier air "from the beach." In order to do so, the number and types of aircraft that would be moved ashore must first be determined.

## **Chapter 4**

### **Numbers and Types of Aircraft to Move Ashore**

*Air control can be established by superiority in numbers, by better employment, by better equipment, or by a combination of these factors.*

—General Carl A. ‘Tooey’ Spaatz

It would be ludicrous, if not impossible, to provide specific numbers and types of aircraft that the Navy should move ashore in every situation. Too much depends on the contextual elements of the particular predicament in which the U.S. finds itself. Although this chapter will not provide concrete answers to the specific numbers and types of aircraft to move ashore, it will discuss many of the elements that should be considered when making this decision. The elements included in this chapter are: mission requirements, the threat, operating base availability, time, number of carriers in theater, and logistics. This list is not all-inclusive but serves as a starting point for determining what to move to land bases. Planners and decision-makers must evaluate their situation within its own particular context to determine the proper course of action.

#### **Mission**

The mission or objective is probably the greatest driving element in deciding what to place ashore and where. At the operational level, the objective “links the tactical

employment of forces to strategic objectives.”<sup>1</sup> According to Joint Pub 3-0, the focus at this level is to “use resources efficiently and effectively to achieve strategic objectives.”<sup>2</sup> This includes the determination of the military conditions that must be produced (ends), the sequence of actions (ways), the deployment and employment of required resources (means), and the acceptable cost or risk to achieve the strategic goal.<sup>3</sup> Specifically, in the case of deploying carrier airpower ashore, the JFC, with the aid of his component commanders, will determine the resources he wants land-based (numbers and types of aircraft), what they must do, how long they will do it, and the justifiable risk allowed in the attainment of mission objectives.

## **Threat**

The threat must be considered in two parts, the threat to the forces ashore and the threat to the forces at sea. When determining the numbers and types of aircraft to move ashore, mitigation of these two threats must be balanced to remain within the acceptable risk-level stated in the mission.

### **Threat to Forces Ashore**

The threat to forces ashore come from either the air or the surface. Air threats include the enemy’s air force and attacks by ballistic or cruise missiles. When carrier aircraft move ashore, they will likely leave behind the protection of their powerful Aegis-equipped escort ships with their associated air and antiballistic-missile defenses. Although Aegis-equipped ships do have the capability to spread their air-defense

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<sup>1</sup> Joint Pub 3-0, *Doctrine for Joint Operations*, 1 February 1995, p. II-2.

<sup>2</sup> Ibid.

<sup>3</sup> Ibid., pp. II-2—II-3.

umbrella over the littorals, it may be necessary to get air defense by other sources, such as Patriot, Hawk, or host-nation systems. Furthermore, depending on the defense assets in place, land-based carrier aircraft may be responsible for their own local air superiority to protect their base. The mission, risk, air threat, and in-place air-defenses will play a large part in any decision in moving naval forces ashore.

Surface forces also represent a threat to land-based carrier airplanes. The threat could range from terrorist acts to a column of enemy tanks overrunning the base. Since carrier air does not bring self-protection ground forces with it, a move ashore must fall on pre-existing ground force-protection. In determining what aircraft to move ashore, decision-makers must determine the availability of ground forces to defend against surface threats and weigh that capability against the perceived threat.

### **Threat to Forces at Sea**

US naval forces represent an enormous investment in time and money. For example, the aircraft carrier, *USS Theodore Roosevelt* took five years to build from the laying of its keel (31 October 1981) to its commission (25 October 1986) at a cost of \$2.5 billion.<sup>4</sup> This does not include the costs of the aircraft of the embarked air wing. Due to this tremendous investment and the number of lives on-board (capacity of over 5,500), it is necessary to protect the carrier from too great of a risk.<sup>5</sup> Many efforts are taken to protect this valuable asset. The battle group usually protects the carrier with up to two Aegis Cruisers, two Destroyers, two Frigates, and two Los Angeles-class submarines. The embarked air wing also provides protection to the carrier. When determining how much

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<sup>4</sup> *USS Theodore Roosevelt CVN-71 Cruise Book*, Vol. VI (1996-1997 Mediterranean Deployment), p. 8.

<sup>5</sup> *Ibid.*, p. 9.

of the air wing to put ashore, one must consider the acceptable risk and threat to the carrier, and the proposed gains from such action.

Normally, when transiting, the threat to the carrier is typically low and airplanes rarely fly. So disembarking portions of the air wing, before a high-speed transit, appears to be a more efficient use of airpower. Aircraft could begin operations from land-bases instead of being chained to the carrier's deck as it dashes into position. The Aegis equipped ships would still be able to provide air defense for the carrier. Even in the higher threat areas such as the Suez Canal or the Straits of Hormuz, carrier aircraft are restricted by rules of transit, which prevent flight operations from the carrier. Typically, if the Navy deems there is sufficient risk to the carrier, it will protect it not only with its escort ships but also with land-based airpower. Normally, while the carrier is in transit the risk is low enough to allow at least a portion of the air wing to disembark and conduct operations from bases ashore.

To enter the area of operations (AO), the Navy must first gain and maintain localized air and sea superiority. The Navy is accustomed to gaining the required air and sea superiority with its ships in the battle group and aircraft from the carrier. Another option that is available, aided by the land basing of naval aircraft, is to start the fight for air and sea superiority prior to the fleet arriving. The JFACC could provide the JFMCC the resources necessary, including carrier airplanes moved ashore, for the sea-superiority battle. The JFACC would be responsible for maintaining air superiority for these operations.

If the threat to the survival of naval forces is in question, another option is to keep high-value assets, like the carrier, out of harms way until that threat is reduced. This

could reduce the number of sorties required to insure protection of the carrier and instead, allow these aircraft to fly more offensive operations from land bases in the area. Freeing sorties allocated to protecting the Navy's greatest center-of-gravity (COG) by keeping it out of harms way, could allow more aircraft to be used in attacks against the enemy's COGs. If secure land bases are available, it would seem unwise to place an aircraft carrier in a high-risk area just to get it into the fight.

### **Air Base Availability**

A basic assumption of this paper is that land bases for combat operations would be available for use by carrier aircraft. It would be remiss, however, not to consider the ramifications of a political decision of an ally to revoke permission to conduct combat sorties from bases in their territory. An even worse case, would be the situation where the U.S. operationally "put all its eggs in one basket" and moved most of its carrier air assets to bases in a country that later revoked all air operations within their country. This would effectively hold US airpower hostage to the political desires of the host nation. Not only could this check military operations, but, more importantly, it could severely limit US political options.

Considerations of this risk must factor into a leader's decision to move carrier air ashore. It is necessary to assess the likelihood that a host government would limit or revoke air operations within its territorial boundaries. Commanders must base their forces in such a manner to mitigate these risks. If there is a significant risk of a host nation restricting operations, the JFACC should base his forces such that "all his eggs are not in one basket." He can accomplish this by basing aircraft in different countries or, if



necessary, by leaving a larger portion of his naval air assets at sea as a hedge against host-nation interference.

### **Time**

The length of time that forces would be deployed ashore may also affect the decision of what carrier aircraft should be deployed ashore. Depending on working relationships between the JFACC and JFMCC, the maritime commander may be leery of relinquishing a portion of his ability to conduct maritime missions for a long period. Further, the longer carrier aircraft remain ashore, the greater their logistical requirements will be. Time, mission requirements, and logistical constraints all intertwine in the decision of what to deploy and where.

### **Multiple Carriers**

Multiple carriers operating in the same area provide more flexibility and options when considering the question of what to deploy ashore. One carrier, operating alone, is only able to sustain air operations for 12 hours. Two or more carriers can provide continuous operations. When more than one carrier is providing airpower, the number of assets available typically exceed JFMCC and fleet protection requirements, thus freeing more sorties and aircraft to the JFACC for his operations. The Navy could make these same excess aircraft available for operations from land bases, if appropriate.

### **Logistics**

It would be relatively simple to launch and fly carrier airplanes to land bases. The problems occur when considering the logistics required to support naval operations

ashore. For example, how does the Navy get its maintenance personnel and equipment, and other support from the carrier to the base or bases where the aircraft are operating? Logistical constraints must be considered when deciding what aircraft to move ashore.

The direct problems associated with the deployment of carrier aircraft ashore include the facts that not all of these airplanes can be air refueled and landing and overflight clearances will likely be required. F-14s, F/A-18s and EA-6Bs can all be air refueled. They may need USAF tanker support, if bases are beyond their ferry range (approximately 1,100 miles)<sup>6</sup>. S-3s can also air refuel, but since they fly a much slower and lower profile than their tactical counterparts, they would likely need their own USAF tankers.

The E-2 and the C-2 Carrier Onboard Delivery aircraft (COD) are not able to in-flight refuel.<sup>7</sup> These aircraft must be within range (1,600 miles for the E-2 and 1,200 miles for the C-2) of their land bases or they must stop at intermediate bases to refuel. This is also true for the aircraft that can in-flight refuel but tanker support is not available. The Navy's ability to secure diplomatic overflight and landing clearances may restrict aircraft routing and refueling stops. Logistical concerns will greatly influence the decision of what carrier aircraft the Navy can move and support ashore. Chapter 6 will cover logistical concerns in more detail.

Overall, there is no set answer to the types and number of aircraft the Navy should or can move ashore for operations "from the beach." Too much depends on the context of the particular situation. Decision-makers must weigh mission requirements, the threat to

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<sup>6</sup> Donald and Lake, pp. 60, 92, and 98.

<sup>7</sup> The C-2A Greyhound is the US Navy's primary Carrier Onboard Delivery aircraft (COD). It can carry 30 passengers or up to 10,000 pounds of cargo that is loaded through a rear opening cargo door and ramp. The

both the forces at sea and ashore, availability and locations of air bases, time requirements, number of carriers operating together, and logistics when determining the number and types of aircraft to move to land bases.

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COD has a range of 1,200 miles. Information gathered from David Donald and Jon Lake, ed., *US Navy & Marine Corps Air Power Directory*, (Westport CT.: Airtime Publishing, 1996), p. 65.

## Chapter 5

# Command and Control

*Air Power is indivisible. If you split it up into compartments, you merely pull it to pieces and destroy its greatest asset – its flexibility.*

—Field Marshal Bernard Montgomery

Joint Pub 3-0 states that the concept of unified action “highlights the synchronized application of all the instruments of national and multinational power.”<sup>1</sup> All JFCs are responsible for, and play a pivotal role in unifying actions.<sup>2</sup> Unity of command provides the means for commanders to ensure unifying actions. A 1993 RAND study of joint air operations between 1942 and 1991 suggests, in order to maintain unity of command:

The CINC [Commander-in-Chief] and his joint force air component commander must be mindful of service and joint doctrine but not be bound by it when it does not fully support the mission at hand. They should insist on a flexible approach to problems while exploiting proven historical principles.<sup>3</sup>

Hopefully by investigating the expansion of naval doctrine to include air operations from land bases the Navy can provide more flexible options to the JFC and JFACC and overcome any present limitations to doing so. This chapter will discuss the command

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<sup>1</sup> Joint Pub 3-0, p. II-3.

<sup>2</sup> Ibid., pp. II-3—II-4.

<sup>3</sup> James A. Winnefeld and Dana J. Johnson, *Joint Air Operations: Pursuit of Unity in Command and Control, 1942-1991*, (Annapolis: Naval Institute Press, 1993), p. 147.

and control (C<sup>2</sup>) structure for naval forces operating away from the carrier and identify limitations to C<sup>2</sup> that presently exist.

## **Command and Control**

Combatant command (COCOM) is unique to the CINC and cannot be transferred or delegated.<sup>4</sup> COCOM, therefore, would remain unaffected by moving carrier assets ashore. Likewise, operational control (OPCON) will not normally change when NAVAIR is moved to land bases. Normally, OPCON is delegated to the numbered Fleet Commander who exercises it through the Battle-Group Commander. There would be no foreseeable reason to change this command relationship. The exercise of tactical command (TACON), however, may change. The JFC will usually delegate TACON to the functional commanders for “local direction and control of movements or maneuvers to accomplish the mission.”<sup>5</sup> Typically, the JFACC assumes TACON of naval air, operating from carriers, once they go “feet dry” (go over land), and relinquishes TACON of naval air assets once they go “feet wet” (go back over water).<sup>6</sup> It would be reasonable for the JFACC to assume TACON of naval air the entire time they are land based. This would avoid the complications associated with having to communicate with and coordinate action through the battle group. This would allow the forces deployed ashore to communicate directly with the combat air operations center (CAOC) concerning the ATO, mission-planning information, aircraft/sortie availability, battle-damage assessment (BDA) and any other relevant information. The decision who will retain TACON of the

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<sup>4</sup> Joint Pub 0-2, *Unified Action Armed Forces (UNAAF)*, (24 February 1995), p. III-3.

<sup>5</sup> Ibid., p. III-3.

<sup>6</sup> This is the command relationship established both in the JTF SWA AOR and for no-fly zone operations over Bosnia.

forces rests with the JFC and will depend on the context of the situation and the personalities involved.

The Battle-Group Commander, through the Air Wing Commander (CAG), would retain OPCON of his forces ashore, and therefore determine who would serve as the commander of these forces. The CAG would likely recommend a decision based on the number of aircraft moved ashore versus what remains afloat. If large enough portions of air wing assets are moved ashore, it is likely that the CAG or his Deputy (both Captains) would move ashore to command these forces. Otherwise, a squadron commander or squadron executive officer (both Commanders) would likely oversee the land-based force. Again, much depends on the particular personalities involved and the context of the situation.

As the JFACC gets TACON of more naval assets, it becomes increasingly important for the Navy to have adequate representation at the air operations center. This naval representative must have the rank and aviation experience necessary to be an advocate for naval concerns. On the make up of the CAOC, the 1993 RAND study suggested that “the functional air component commander should have a joint staff and senior representatives of the components’ forces on duty at his air operation center.”<sup>7</sup> The study goes on to recommend “the appointment of a deputy JFACC from a service other than that of [the] JFACC himself.”<sup>8</sup> The JFACC is usually a numbered Air Force Commander with three stars. The Navy should be ready to provide an appropriately experienced aviator to serve as the deputy JFACC and advocate for the Navy. This admiral should come from outside the battle group. The one- or two-star Battle-Group Commander, and his staff, will be

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<sup>7</sup> Winnefeld and Johnson, p. 150.

too preoccupied with operations within the battle group. Furthermore, he may not have an aviation background. One option is to select a Battle-Group Commander, who is a previous aviator, who has recently completed a deployment.

No matter who is selected as the naval advocate to the JFACC, the deployed forces must be able to communicate with the CAOC. “Communications are the known Achilles’ heel of any military operation, but particularly of a joint air operation.”<sup>9</sup> This is especially true when trying to command or control naval forces ashore. If land-based naval forces are not able to use the communication resources of another service, they presently have little capability to maintain connectivity. During the TR Battle-Group 1996-97 Mediterranean Cruise, the air wing had to rely on in-place communications for detachments ashore. When these assets did not exist, the only means available to communicate with these forces were long-distance lines and an airborne E-2 communications relay for unclassified information. For classified information, the air wing used very limited satellite communications (SATCOM) using a terminal operated by one of the battle group’s SEAL teams.<sup>10</sup> If the Navy is going to operate “from the beach” in the future, it will need to invest in some portable contingency theater automated planning system (CTAP) terminals and deployable secure SATCOM capability.<sup>11</sup>

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<sup>8</sup> Ibid., p. 170.

<sup>9</sup> Ibid., p. 164.

<sup>10</sup> The battle group normally deploys with two SEAL teams. SEAL teams serve as the Special Forces of the battle group. The SEAL teams do have a limited secure satellite communication capability.

<sup>11</sup> CTAP provides connectivity with the air operations center. It provides the means of developing, transmitting, and receiving the air tasking order (ATO). It also has a capability to communicate by keyboard to others on the system.

In summary, the command and control structure for naval operations would not have to differ from what is currently in place for small naval detachments sent ashore. The biggest question that the JFC needs to answer is will the JFACC retain TACON of naval forces while they remain deployed to land-bases. If the Navy is going to provide the JFACC more air assets from land bases, relinquishing TACON of those forces, it becomes increasingly important for the Navy to have a strong advocate within the air operations center. Since it cannot be guaranteed that carrier aircraft will be deployed to bases with robust communications, the Navy must invest in a limited amount of portable equipment so that these forces can maintain connectivity with those commanding, controlling and/or coordinating their operations.



## Chapter 6

### Logistics

*Good airplanes are more important than superiority in numbers.*

—Air Vice-Marshal J. E. ‘Johnnie’ Johnson, RAF

*I don’t know what the hell this ‘logistics’ is that Marshall is always talking about, but I want some of it.*

—Fleet Admiral E. J. King to staff officer, 1942

*It takes little skill or imagination to see where you would like your army to be and when; it takes much more knowledge and hard work to know where you can place your forces and whether you can maintain them there.*

—General A. C. P. Wavell

The Air Force and Navy have a great ability to conduct air operations together.

Interoperability is defined by Joint Pub 1-02, *Approved Terminology*, as:

The ability of systems, units or forces to provide services to and accept services from other systems, units, or forces and to use the services so exchanged to enable them to operate effectively together.<sup>1</sup>

It would not be difficult for USAF F-15s to provide air-superiority protection for a Navy strike package. Likewise, an F/A-18 and EA-6B in coordination with an F-16 Harm Targeting System (HTS) can work together to provide suppression of enemy air defenses (SEAD) support for an interservice strike force. This type of interoperability is

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<sup>1</sup> Joint Pub 1-02, *Approved Terminology: DOD Dictionary*, 23 March 1994, Updated through April 1997, p. 277.

the standard for US operations around the world and both the Navy and the Air Force have operationally achieved a high-level of interoperability in the air.

The conduct of warfare, however, requires more than just operations. “Operations and logistics are inseparable facets of war. Neither can claim primacy; each is integral to the other.”<sup>2</sup> Although the two services have done well in achieving operational interoperability, the same cannot be said about logistical support. If the two air forces are to efficiently and effectively work together, they must not only continue to sharpen their interoperability skills in the air, but they must also overcome barriers to interoperability on the ground.

The purpose of this chapter is to investigate the logistical issues associated with moving carrier aircraft ashore to conduct operations “from the beach.” The biggest hindrance to operating naval air from bases ashore is how to sustain their combat operations. Accordingly, this chapter will discuss the transportation, weapons, and sustainability issues associated with this type of air operation. The discussion is suggestive in nature. A more definitive study on logistics would require a thesis of its own.

## **Transportation**

The process of moving airplanes from the carrier to shore bases is a relatively easy process of securing any required air refueling and diplomatic flight clearances, filing flight plans, and launching the aircraft. The same cannot be said for moving the support necessary to sustain these operations ashore; it can be a much more difficult procedure.

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<sup>2</sup> Joint Pub 4-0, *Doctrine for Logistic Support of Joint Operations*, (27 January 1995), p. II-4.

The rule of thumb the Navy uses to determine the approximate number of personnel that it must muster for maintenance and support, is 10 maintainers for every airplane deployed.<sup>3</sup> Therefore, a typical F/A-18 squadron would have to send 120 people ashore to support 12 aircraft. In addition, approximately 15 tons of maintenance equipment is also necessary to support the squadron.<sup>4</sup> Fortunately, as the air wing moves more aircraft ashore, the equipment requirements do not increase proportionally with the number of airplanes.<sup>5</sup> Indeed, certain tools required to maintain and sustain the airplanes must be moved regardless of the number of aircraft moved ashore. However, if aircraft are going to be ashore for more than a few days, periodic maintenance and inspections will also be required. This will increase the further increase personnel and equipment requirements.



**Figure 7. C-2 Greyhound Carrier On-Board Delivery Aircraft (COD)**

Deciding how to move all the supporting personnel and equipment from a carrier to operating locations ashore can be challenging. Even if the carrier is near a port, diplomatic limitations, security restrictions, or the physical limitations of a port itself, prevent the Navy from bringing a nuclear vessel pier-side in most ports around the world. Instead, the carrier must use its own launches, contracted ferries, and/or helicopters to move personnel and equipment on and off the carrier. In order to use these, the carrier

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<sup>3</sup> LCDR Robert Boyer, Operations Officer and former Maintenance Officer for VFA-83, interviewed by author 11 March 1999.

<sup>4</sup> Ibid.

<sup>5</sup> Ibid.

must be positioned within a few miles of a port and the sea state must be relatively calm.<sup>6</sup> If the seas are too rough for boat operations or the ship is too far at sea, the bulk of the logistic support must be provided by the C-2 (COD), or if within a few hundred miles of land, the H-53 Super Stallion. The COD is capable of transporting 30 passengers or 10,000 pounds of equipment up to a range of 1,200 miles.<sup>7</sup>



**Figure 8. H-53 Stallion**

The H-53 normally can carry approximately 50 passengers and a payload of 9.8 tons a distance of 500 nautical miles.<sup>8</sup> When within 150 nautical miles of land, the Navy can use the two CH-46 Sea Knight helicopters that are part of the battle group.<sup>9</sup> The CH-46 has even less of a transport capability. It can carry a maximum of 2.5 tons of cargo or 22 passengers.<sup>10</sup> If supplies and personnel are offloaded at a location other than the

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<sup>6</sup> It is not unusual for launch and ferry operations to be suspended for sea state. Most ports require the carrier to anchor outside the protection of a port where it is subjected to rougher conditions than what would be expected in port.

<sup>7</sup> Donald and Lake, p. 65. Typically, only two COD's support a carrier. Furthermore, COD crews are normally only qualified for day carrier landings and catapult launches. Carrier launches and recoveries with passengers are not authorized at night. This and the range from land bases to the carrier restrict the amount of cargo and personnel that the COD can transport per day.

<sup>8</sup> "Navy Fact File: CH-53E Super Stallion," (Wash D.C.: Public Affairs Office, Naval Air Systems Command (Air 07D2)), n.d., n.p.; on-line, Internet, 11 March 1999, available from [http://sunsite.sut.ac.jp/arch/academic/history/marshall/military/navy/USN\\_aircraft.txt](http://sunsite.sut.ac.jp/arch/academic/history/marshall/military/navy/USN_aircraft.txt). Typically, two H-53s support a carrier battle group. Just like the COD, they are restricted to daylight only operations with passengers. This and the distance the carrier is away from land limit the amount of cargo and personnel the H-53s can transport per day.

<sup>9</sup> "Navy Fact File: CH-46 Sea Knight," n.d., n.p.; on-line, Internet, 22 March 1999, available from <http://www.chinfo.navy.mil/navpalib/factfile/aircraft/air-ch46.html>.

<sup>10</sup> Ibid., the CH-46 is limited to the same passenger restrictions during nighttime operations as the H-53.

squadron's operating base, they must then be moved by surface or air transports, not associated with the carrier. Although this process is not simple, it is achievable as long as the carrier is within the COD's range and transportation is available to move equipment and personnel from the COD's point of delivery to the forward operating locations.



**Figure 9. CH-46 Sea Knight Vertical Replenishment (VERTREP)**

## **Weapons**

The services have, and continue to improve, weapons interoperability. They use many of the same weapons to conduct their missions. Indeed, the new weapons that are coming on-line or that are in development demonstrate that this trend toward weapon interoperability is continuing.<sup>11</sup> Furthermore, naval aircraft's weapon release systems are programmed to drop both carrier certified munitions and non-carrier certified

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<sup>11</sup> Joint development and acquisition of systems like JDAM (Joint Direct Attack Munition), JSOW (Joint Stand-off Weapon), and non-lethal weapons show a positive move toward weapon interoperability.

munitions.<sup>12</sup> Although weapons development and acquisition interoperability is going well, problems still exist at the logistical-support level. Some of these problems include munitions supply, weapon loaders, and some other technical limitations.

### **Munitions Supply**

When aircraft disembark from the carrier, they leave their supply of munitions behind in the weapons stores onboard the carrier and in its resupply ship. Therefore, logisticians must insure that munitions are available at their new base of operations. Aircraft will need to deploy to bases where stores already exist or, otherwise, logisticians will have to relocate weapons to the base from other sources. Other potential sources for munitions include worldwide joint war reserves, naval weapon resupply locations, or the carrier and its resupply ship. Movement of weapons from reserves or resupply locations would likely follow the same established procedures for the movement of munitions to USAF units within the theater. Movement of armament from the carrier would be more involved. The munitions from the ship's weapons magazine would have to be moved to the flight deck, stopping flight operations, and then moved by helicopter over to the resupply ship.<sup>13</sup> Then the resupply ship would transit to a port, capable of handling the munitions, for offload. Once offloaded the munitions would still have to be transported using theater-established procedures to their base of operations. This process is achievable but can be difficult and time consuming.

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<sup>12</sup> Certain munitions, like general purpose MK-82, MK-83, and MK-84 bomb bodies, must be covered with a special thermal protection coating to be stored aboard the carrier. This coating slightly changes the ballistic profile of the weapons.

<sup>13</sup> In May 1997, the *USS Theodore Roosevelt*, before her return to the U.S. for refit, transferred her entire weapons load to a munitions ship. The transfer of weapons took three full days to complete despite weeks of planning and no real problems during the transfer. The transfer of weapons is an involved process and can close up to half the flight deck.



**Figure 10. Bombs for Operation Desert Fox Wait for Loading Aboard *USS Enterprise***

### **Weapons Loaders**

Even if carrier aircraft were deployed to a base where USAF support, and munitions were already available, Air Force weapons loading personnel are not presently certified to load naval aircraft.<sup>14</sup> Subsequently, each aircraft would be able to fly one mission with the weapons that were already loaded before departed the carrier. If pilots expend those munitions, their aircraft would then have to remain on the ground until naval certified weapons loaders arrived. Currently, there is no training system in place to increase the interoperability of the services' weapons loaders by certifying them on both USN and USAF systems.

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<sup>14</sup> LCDR Stamos interview.



**Figure 11. “Orddies” Load F/A-18 with LGB during Desert Fox**

### **Technical Limitation**

When naval certified weapons loaders arrived, or if Air Force weapons loaders were trained to arm Navy jets, other technical limitations would still exist. Since naval doctrine does not consider operations “from the beach,” technical manuals do not accommodate such a possibility. Naval technical manuals presently prohibit loaders from interchanging parts. There is no allowance for a weapons loader to use an equivalent Air



Force part number in place of a Navy part number.<sup>15</sup> Since all parts that the Navy uses for operations aboard the carrier must meet tighter fire and stress restrictions than Air Force parts, they can be slightly different.<sup>16</sup> Again, because present naval doctrine does not consider sustained combat operations from land-bases, there is no allowance made for combat sorties that could launch and recover from shore bases. All sorties must fly with carrier certified parts and equipment. Furthermore, even if USAF compatible parts could be used, they would still need to get release certified.<sup>17</sup> Presently, naval doctrine limits the service's capabilities to employ combat power from land. The mindset is different, however, when it comes to non-combat sorties flown from land bases. For example, technical manuals do include provisions for different pressure settings for tires and the hook damper for carrier versus land operations.

## **Sustainability**

Once carrier aircraft arrive at their land bases, they will need maintenance service to sustain operations. Fortunately, not all the news is bad in the area of sustainability. The Navy and the Air Force use the same petroleum, oil and lubricants (POL) and have similar aircraft ground equipment (AGE).<sup>18</sup> This would allow naval aircraft to fly into an Air Force operating location and be able to refuel, change the oil or hydraulic fluids, repressurize hydraulic reservoirs, and, for aircraft requiring a start cart to get restarted, do so using USAF POL and AGE.

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<sup>15</sup> Ibid.

<sup>16</sup> Ibid.

<sup>17</sup> Ibid. Release certification signifies that the munitions can be safely dropped or launched from the delivery aircraft.

<sup>18</sup> LCDR Boyer and LCDR Stamos interviews.

A problem that presents itself, however, is a lack of training. If a carrier's aircraft arrive at their land bases before their maintainers, it is likely that the aircraft would be grounded until the maintainers arrived to reservice the airplanes. This turn-around would likely be slow using Air Force personnel because, presently, USAF maintenance personnel are not trained or exposed to the procedures required to service naval aircraft, unless they have served on an Air Force Base transient-alert team. Transient-alert teams consist of maintainers, not associated with an Air Force squadron, who are responsible for performing minor maintenance and servicing functions to turn all aircraft that do not belong to that base. Today, the Air Force is outsourcing more and more of its transient alert functions to contractors, further reducing the deployable experience to turn all but squadron aircraft.



**Figure 12. Plane Captains Repairing Landing Gear**

Another problem facing the Navy's ability to sustain operations ashore is its current maintenance structure. The Navy operates on a three-level system that consists of command-level maintenance (squadron-level), intermediate-level maintenance (Aircraft

Intermediate Maintenance Department (AIMD)), and depot-level maintenance.<sup>19</sup> At the low-end, command-level maintenance consists of the plane captains and maintenance personnel who are responsible for airplane servicing and minor repairs. At the high-end, depot-level maintenance does all the major aircraft repairs and refits. Between the two is AIMD. AIMD consists of specialty shops that are responsible for all maintenance short of moving an aircraft to a depot for months of major work but more than the changing of oil, tires, and other minor work squadron maintenance performs. AIMD is responsible for repairing such things as electronic components (black boxes), radar systems, forward-looking infrared receivers (FLIRs), and sheet metal repair.

AIMD shops exist on each carrier and home base. Presently, the Navy has not designed them to be transportable. The US Marine Corps (USMC), with its concept of a 911 expeditionary force, has configured sustainability kits on both the east and west coast of the U.S. to perform this mission.<sup>20</sup> These rapidly transportable kits are packed in containers designed to support contingencies of various duration.<sup>21</sup> Unfortunately, the Navy does not have a similar system to sustain land-based operations. The service currently uses the COD to move parts requiring intermediate-level maintenance between its beach detachment and AIMD shops onboard the carrier. Typically, one COD sortie each day is scheduled for this function.<sup>22</sup>

It is likely that the doctrinal differences between the USMC and USN are a large reason why the Marines have such a system and the Navy does not. USMC doctrine

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<sup>19</sup> Ibid.

<sup>20</sup> LTCOL Randolph D. Allies, former commanding officer of VFMA-312, interviewed by author during visit to the Naval War College, Newport, RI, 15 Jan 99.

<sup>21</sup> Ibid.

<sup>22</sup> LCDR Boyer, interview.

states, “the Marine Corps is an expeditionary Service because it can prepare and *deploy logistically sustainable forces into areas with little or no existing U.S. logistical capability* [emphasis added].”<sup>23</sup> Whereas the USMC’s doctrine includes the concept of sustaining forces anywhere, the Navy’s concept of “From the Sea...” only considers sustaining forces at sea.<sup>24</sup> Therefore, the Navy has not developed capabilities to sustain aircraft ashore.

Although interoperability between the nation’s TACAIR forces has improved greatly and provides the potential for a very potent airpower force, naval doctrine’s influence on its logistics fail to harness the full promise of joint airpower. Current doctrine limits the ability to sustain combat operations ashore. Although interoperability is improving, the ability to jointly service and reload aircraft is still lacking. Much remains to be done in the areas of doctrine, training, maintenance procedures, and logistical support to improve interoperability and, likewise, combat sustainability. With improvements in logistical interoperability, the nagging problems associated with transporting maintenance personnel, parts and equipment from the carrier to shore bases will be reduced due to the Navy’s increased capability to use qualified personnel, parts, and equipment from other sources. Increased interoperability, however, requires the efforts of more than just the

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<sup>23</sup> FMFRP 2-12, *Marine Air-Ground Task Force: A Global Capability*, (Washington D.C.: Department of the Navy, Headquarters United States Marine Corps, 10 April 1991), p. 2.

<sup>24</sup> Department of the Navy White Paper “...From the Sea,” pp. 6-7. When discussing power projection the paper states when employing naval airpower it “can provide strike capability short of putting forces

Navy. The Air Force must also be willing to help support naval operations ashore. The next chapter will discuss issues that the JFACC and JFC must tackle in order to help support these kinds of operations and harness their potential capabilities.

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ashore.” It continues, “Remaining ready indefinitely to strike, this potential force *from the sea* [original emphasis] is a critical tool for diplomacy and influence.”

## Chapter 7

### JFACC and JFC Support to the Fleet

*The airplane is the only weapon which can engage with equal facility, land, sea, and other forces. ...*

—Major General Frank M. Andrews  
Army Air Corps, 1938

*We have the enemy surrounded. We are dug in and have overwhelming numbers. But enemy airpower is mauling us badly. We will have to withdraw.*

—Japanese infantry commander  
Situation Report to Headquarters, Burma, WW II.

*To have command of the air means to be able to cut an enemy's army and navy off from their bases of operation and nullify their chances of winning the war.*

—General Giulio Douhet

At least for the near-term, operating carrier aircraft “from the beach” is like the proverbial “fish out of water.” Until the Navy has had time to develop the force and logistical support required for operations “from the beach,” they will need assistance. Key areas in which the Navy would need help are logistics, force protection, and JFMCC mission support.

As the last chapter emphasized, the ability of the Navy to operate “from the beach,” is constrained by the logistics it needs to support these operations. The Navy has some

unique problems maintaining its forces ashore. First, it is not accustomed to doing so. The service's current doctrine of "From the Sea..." has limited the its ability to thoroughly consider sustained combat operations "from the beach." Second, the logistical structure of the Navy is not organized to support long-term offensive operations ashore. Third, the transportation of parts and equipment from the carrier to forward operating locations on land can be a difficult process. Fourth, the Navy's current ability to deploy command control and communications equipment ashore to maintain its connectivity is limited.

The JFC has overall directive authority for logistics.<sup>1</sup> He can use his authority to help mitigate these limitations. For example, the JFC could provide priority support to naval forces ashore so that they could execute their mission better.

The Navy is also concerned about the threat, both to forces ashore and forces at sea. The JFC has ultimate responsibility to provide adequate force protection to both these naval forces. Since the Navy does not have the ability to protect its forces ashore, the JFC must determine how he wants to protect them. Some options include moving carrier aircraft to bases where force protection has already been established or to use ground forces from the other services to protect naval assets ashore. Likewise, as the overall commander, the JFC can help insure the other functional commanders provide adequate support to the JFMCC for the protection of the forces at sea.

The relationship between the JFACC and JFMCC, overseen by the JFC, is critical to achieving the highest level of combat effectiveness possible between air and sea forces. As stated in chapter 2, to be the most effective, airpower cannot be limited by lines on the

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<sup>1</sup> Joint Pub 0-2, page III-7.

ground. This includes coastlines. Theoretically, the JFACC's responsibilities for air operations should not stop at the beach. As stated by Field Marshall Bernard Montgomery, "Air is indivisible. If you split it into compartments you merely pull it to pieces and destroy its greatest asset—its flexibility."<sup>2</sup> Current practice frequently does just that, split aviation assets. A line is drawn at the coast and the JFACC conducts air operations on the land side of the line and the JFMCC, with support of "his" aircraft, conducts maritime operations on his side of the line. This breaks-up and compartmentalizes airpower, thus weakening it.

A better solution would be for the JFACC to be responsible for air operations throughout the theater and to coordinate any operations over water with the JFMCC. Furthermore, the JFACC would be responsible for supporting the JFMCC's missions. This would establish centralized control of airpower, making it more effective in achieving overall theater objectives. Additionally, when the Navy provides the preponderance of fixed wing assets (for example, in a maritime scenario), the JFACC will likely be a naval officer with a good understanding of JFMCC requirements.

In practice, the concept of operating carrier airpower "from the beach" would have to involve the breaking down of present-day barriers on how joint forces operate. This would require a great deal of trust on the part of the JFMCC in the JFACC's ability to support maritime requirements, and in the JFC's ability to ensure the JFACC does so. To make this happen, the JFACC must do everything possible to gain this trust by providing outstanding support to the JFMCC. The JFMCC, for his part, must not exaggerate his air requirements. This will help foster working relationships not only during current

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<sup>2</sup> Field Marshal Bernard Montgomery, "Great Aviation Quotes: Air Power," n.d., p. 3; on-line, Internet, 18 February 1999, available from <http://www.skygod.com/quotes/file15.html>.



operations but also in future operations. The more trust the JFACC can build within the JFMCC that he will support maritime missions and protect valuable naval assets at sea, the more willing the Navy will be in freeing air assets to the JFACC for theater-wide objectives. Likewise, the JFMCC must establish the credibility of his air demands so that the JFACC stays responsive to maritime taskings. The JFC should demand this type of relationship for it could only serve to improve our nation's ability to conduct joint operations.

## Chapter 8

### Conclusions

*I am tempted indeed to declare dogmatically that whatever doctrine the armed forces are working on now, they have got it wrong. ... Still it is the task of military science in an age of peace to prevent the doctrines from being too badly wrong.*

—Sir Michael Howard

*Air power is like poker. A second best hand is like none at all—it will cost you dough and win you nothing*

—General George Kenney

In the aftermath of the Soviet Union’s break-up and the Gulf War, the USN instituted its current “From the Sea...” doctrine, a “fundamental shift away from open-ocean warfighting on the sea toward joint operations conducted from the sea.”<sup>1</sup> Although this doctrinal shift is a positive move that better recognizes the joint nature of warfare, and that the Navy is part of a “sea-air-land” team, it still falls short of optimizing naval airpower’s contribution to the joint team. The Navy’s focus provides airpower “From the Sea...” short of putting forces ashore.<sup>2</sup> Carrier-based aviation is a critical component of national security and the protection of US national interests worldwide. However,

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<sup>1</sup> “Forward From the Sea...,” p.2.

<sup>2</sup> Ibid., p. 6.

current naval doctrine ignores the possibility that carrier aviation assets may be required to operated from land-bases and that, at times, it may be more efficient to do so.

Both historical and theoretical examples show a need for the Navy to modify its doctrine to include a capability to employ carrier airpower “from the beach.” In 1994, when Saddam Hussein moved his military south in a show of force against Saudi Arabia and Kuwait, the U.S. initiated VIGILANT WARRIOR to deploy forces back into the theater to counter Iraqi intentions. Unfortunately, the nearest aircraft carrier was a week’s transit from its operating location in the Persian Gulf. Admiral Prueher, Deputy JFACC at the time, attempted to move a portion of the air wing ashore to provide a halting force, while the carrier was out of range.<sup>3</sup> Admiral Prueher, however, was unable to get naval air assets ashore.<sup>4</sup> Throughout the 1990s, carrier-based aircraft have consistently been hindered by limitations in their payload, range and sortie rates as compared to land-based airpower. After-action reports from DESERT STORM, VIGILANT WARRIOR, DELIBERATE FORCE and DESERT FOX indicate there may be operational benefits to moving air assets ashore.

Theoretical studies also lead to the conclusion that there are advantages to the Navy to change its doctrine to incorporate an ability to operate its airpower “from the beach” in certain situations. The impetus for these operations should be an increase in airpower’s potential strengths and synergies. In fact, improvements in range, sortie rates, weapons loads, and operational efficiency are convincing reasons for moving carrier airplanes ashore in certain situations.

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<sup>3</sup> Adm. Prueher.

<sup>4</sup> Ibid.

When attempting to determine what aircraft to move ashore for operations “from the beach,” the context of the situation must again be evaluated by decision-makers. Some of the factors affecting the numbers and types of aircraft to move ashore include mission objectives and requirements, the threat to forces ashore and at sea, air base availability, the duration of operations, the number of carriers working together in close proximity, and logistics.

Unquestionably, there are challenges to modifying current naval doctrine to include the ability to conduct operations “from the beach” in some situations. Two of the largest challenges are in the areas of command, control and communications (C<sup>3</sup>), and logistics. Operational control of naval forces operating ashore would likely remain with the numbered Fleet Commander and be exercised through the Battle-Group Commander. The issue of tactical control is a bit more difficult. The Joint Forces Commander (JFC) will have to determine whether the situation dictates that naval forces ashore remain under the tactical control (TACON) of the fleet after mission completion or will the JFACC have TACON. He would make this decision based on such considerations as the context of the crisis, the personalities involved, and the nature of existing communications connectivity. The current capability of naval forces ashore to communicate and coordinate with others is somewhat limited. It would be less constraining for naval forces ashore to use the communication facilities of other co-located services. Since this cannot always be guaranteed, the Navy must invest in increasing its transportable command, control, communications, and intelligence equipment.

Operations ashore face logistical restraints. Although it is relatively easy to move aircraft from the carrier to land bases, transporting aircraft support personnel and equipment is more difficult. The distance from the carrier to land and the ability of CODs and helicopters to move parts, as well as people, limits transportation. Even if the carrier is close to land, for a variety of reasons, it will rarely pull pier-side to offload. Instead, if sea states permit, the Navy will use contracted ferries and the carriers own launches to move personnel and equipment. Another logistical problem when aircraft operate ashore is that they leave their normal supply of weapons onboard the carrier. Logisticians must relocate munitions to operating locations ashore. Furthermore, a lack of interoperability between USAF and USN, maintenance, weapons, and weapons loaders, hinders the Navy's ability to sustain operations "from the beach."

In order to maximize joint airpower and overcome present limitations, the JFC and JFACC must take an active role in helping the Navy and JFMCC. At least for the near-term, the Navy will need time to develop its force and logistical support for sustained operations from land bases. Furthermore, the addition of a "from the beach" capability to current doctrine, will represent a change in culture for the Navy. The JFC can use his authority to help mitigate these hindrances in several ways. He can ensure that the Navy receives priority logistical support. The JFC can also require that the other services and functional commanders provide the necessary support to the JFMCC for force protection and conduct of maritime missions. The maritime commander must be confident that the JFACC will provide substantive airpower to cover his maritime requirements. This trust is critical for a successful relationship. The air components commander's partnership with the JFMCC and his support of maritime missions will go a long way in overcoming

cultural concerns that the JFACC will not support maritime operations with the naval aircraft allocated to him. The more the JFACC can build an alliance, the more likely the JFMCC and Navy will release air assets to the JFACC. In turn, this would increase the indivisibility, efficiency, strength, and flexibility of airpower.

## **Implications**

Employing naval airpower “from the beach” is, in some situations, more advantageous than conducting operations from the carrier. The capability to conduct sustained air operations from land bases will have implications on naval doctrine, joint training, and operations.

### **Doctrine**

Doctrine represents the “fundamental principles by which the military force or elements thereof guide their actions in support of national objectives.”<sup>5</sup> Doctrine guides such essential actions as research and development, acquisition, and training. These actions represent the foundation of combat operations. If the Navy is to take advantage of the potential opportunities that air operations conducted from land bases present, it is imperative that the Navy expand its current doctrine of “...From the Sea” to include a doctrine for air operations “from the beach.” In this time of reduced budgets and high operations tempo, units will not receive the training and equipment necessary to implement this type of operation unless the service makes a corresponding change to its doctrine. A change in naval doctrine will be the engine to effect revisions in training,

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<sup>5</sup> Joint Pub 1-02, p. 174.

logistical support and operations necessary to provide the nation with a more powerful, flexible, and efficient capability.

## **Training**

As stated earlier, the USAF and the USN have worked hard to train their aircrews to work successfully as a joint team in the conduct of air operations. Support functions on the ground, however, have not received similar opportunities. USAF squadron maintenance personnel receive little to no training in servicing naval aircraft. Air Force munitions crews are not certified to load Navy aircraft. Naval weapons loaders are restricted from using USAF equivalent parts and munitions, not certified for carrier operations, for loading onto naval aircraft, even when these aircraft are conducting operations from the land only. Unquestionably, interoperability training needs to improve at the maintenance and support levels of operations.

One possible solution is to conduct maintenance and weapons-loading training similar to that which NATO (the North Atlantic Treaty Organization) conducted in the 1980s and 1990s to improve the interoperability among its nations. The training was called an AMPLE GAIN exercise. One or two aircraft were flown to a foreign base where local crews would practice servicing and loading the aircraft for three to four hours. During the same time, the aircrew that flew the aircraft into the location would typically meet with the host-nation's aircrews. They would debrief the mission they had just flown with the other nation, brief the mission they planned to fly on departure, and spend quality time improving relationships with the host nation. This represents an excellent opportunity to increase joint airpower interoperability at all levels. If these

exercises could be successfully conducted among different countries, surely they would also be beneficial to two services within the same country.

Additionally, if interoperability is to fully exist in the air, the USAF will have to continue to improve training in the areas that have, in the past, been reserved for naval airpower. Air Force units should increase its interoperability training with naval units in the conduct of such missions as sea surveillance and surface warfare. Once the USN and USAF are both fully trained to accomplish most air missions, then the functional commanders no longer need to be concerned which service's aircraft will support their requirements. This level of interoperability will help further airpower's greatest attribute, its flexibility.

### **Logistics**

Exercises like AMPLE GAIN also represent excellent opportunities to discover any additional interoperability problems with logistics, parts, systems, and procedures. Once maintainers, and weapons loaders start working together to turn aircraft in support of operations "from the beach," they will easily identify impediments to joint interoperability. These same professionals are the best qualified to devise solutions to improve interoperability at this level. Both services need to be ready to act on their suggestions, be it in research and development, acquisition, or procedures.

### **Operations**

Ultimately, the best way to increase the interoperability and effectiveness of airpower is to conduct joint operations using the concepts presented in this paper and learn from their lessons. It will be critical to both the short and long-term success of joint air operations for the personalities in command to quickly establish genuine trust. The



CINC and JFC must demand and ensure that functional and service components avoid turf battles in the interest of joint interoperability. Airpower can be a decisive part of joint operations. The concepts presented herein can only help make airpower's contribution to the team all the more momentous.

## *Glossary*

ACSC	Air Command and Staff College
AFB	Air Force Base
AGE	Aircraft Ground Equipment
AMID	Aircraft Intermediate Maintenance Department
AO	Area of Operations
ATO	Air Tasking Order
AU	Air University
BDA	Battle Damage Assessment
C <sup>2</sup>	Command and Control
C <sup>3</sup>	Command, Control, and Communications
C <sup>4</sup>	Command, Control, Communications, and Computer Systems
C <sup>4</sup> I	Command, Control, Communications, Computer Systems, and Intelligence
CADRE	College of Aerospace Doctrine, Research, and Education
CAG	Commander, Carrier Air Wing
CAOC	Combat Air Operations Center
CFACC	Coalition Forces Air Component Commander
CINC	Commander-in-Chief
COCOM	Combatant Command
COD	Carrier On-board Delivery
COG	Center of Gravity
CONUS	Continental United States
CTAPS	Contingency Theater Automated Planning System
CVW	Carrier Air Wing
DOD	Department of Defense
FLIR	Forward-Looking Infrared Receiver
HTS	Harm Targeting System
JFACC	Joint Forces Air Component Commander
JFC	Joint Forces Commander
JFGCC	Joint Forces Ground Component Commander (or JFLCC)
JFLCC	Joint Forces Land Component Commander (or JFGCC)

JFMCC	Joint Forces Maritime Component Commander
NATO	North Atlantic Treaty Organization
NAVAIR	Naval Air (naval aircraft)
OPCON	Operational Control
PGM	Precision-Guided Munition
POL	Petroleum, Oil, and Lubricants
SAAS	School of Advanced Airpower Studies
SATCOM	Satellite Communications
SEAD	Suppression of Enemy Air Defenses
SEAL	Sea-Air-Land Team
TACAIR	Tactical Air (tactical aircraft)
TACON	Tactical Control
TACNOTES	Standard operating procedures techniques and procedures
UN	United Nations
USCINCPAC	Commander-in-Chief, US Pacific Command
USMC	United States Marine Corps
USN	United States Navy
USAF	United States Air Force
USS	United States Ship

**Aegis.** A totally integrated shipboard weapon system that combines computers, radars, and missiles to provide a defense umbrella for surface shipping. The system is capable of automatically detecting, tracking, and destroying airborne, seaborne, and land-launched weapons. (Joint Pub 1-02)

**Air Boss.** Naval Commander or Captain responsible for all air operations on and in the immediate vicinity of the carrier.

**aircraft arresting gear.** A device used to engage hook-equipped aircraft to absorb the forward momentum of a routine or emergency landing or aborted takeoff. (Joint Pub 1-02)

**air tasking order.** A message used to task joint force components; to inform the requesting command and the tasking authority of the action being taken; and/or to provide additional information about the mission. The message is used only for preplanned missions and is transmitted on a daily basis. (Joint Pub 1-02)

**battle damage assessment.** The timely and accurate estimate of damage resulting from the application of military force against a predetermined objective. (Joint Pub 1-02)

**beach.** Used as a synonym for land.

**catapult.** A structure which provides an auxiliary source of thrust to an aircraft. (Joint Pub 1-02)

**centers of gravity.** Those characteristics, capabilities, or localities from which a military force derives its freedom of action, physical strength, or will to fight. (Joint Pub 1-02)

**combatant command (command authority).** Nontransferable command authority established by title 10 (“Armed Forces”), United States Code, exercised only by commanders of unified or specified commanders unless otherwise directed by the President or the Secretary of Defense. Normally this authority is exercised through subordinate joint force commanders and Service and/or functional component commanders. Combatant command provides full authority to organize and employ commands and forces as the combatant commander considers necessary to accomplish assigned missions. (Joint Pub 1-02)

**cyclic operations.** A method of operations on-board a carrier where aircraft are launched then others recovered. The process repeats itself every “cycle.” Aircraft are launched and recovered at set times. Cycle times vary between 1 hour and 1 hour and thirty minutes.

**feet dry.** Code meaning, “I am, or contact designated is, overland.” (Joint Pub 1-02)

**feet wet.** Code meaning, “I am, or contact designated is, over water.” (Joint Pub 1-02)

**flex-deck operations.** A method of operations on-board a carrier where aircraft can be launched or recovered at anytime.

**force protection.** Security program designed to protect military personnel, civilian employees, family members, facilities, and equipment, in all locations and situations, accomplished through planned and integrated application of combating terrorism, physical security, operations security, personal protective services, and supported by intelligence, counterintelligence, and other security programs. (Joint Pub 1-02)

**forward looking infrared.** An airborne, electro-optical thermal imaging device that detects far-infrared energy, converts the energy into an electronic signal, and provides a visible image for day or night viewing (Joint Pub 1-02)

**function component command.** A command normally, but not necessarily, composed of forces of two or more Military Departments which may be established across the range of military operations to perform particular operational missions. (Joint Pub 1-02)

**interoperability.** The ability of systems, units or forces to provide services to and accept services from other systems, units, or forces and to use the services so exchanged to enable them to operate effectively together. (Joint Pub 1-02)

**joint air operations center.** A jointly staffed facility established for planning, directing, and executing joint air operations in support of the joint force commander’s operation or campaign objectives. (Joint Pub 1-02)

**joint force air component commander.** The joint force air component commander derives authority from the joint force commander who has authority to exercise operational control, assign missions, direct coordination among subordinate commanders, redirect and organize forces to ensure unity of effort in the accomplishment of the overall mission. The joint force air component commander will recommend to the joint force commander apportionment of air sorties to various missions or geographic areas. (Joint Pub 1-02)

**joint force commander.** A general term applied to a combatant commander, subunified commander, or joint task force commander authorized to exercise combatant

command (command authority) or operational control over a joint force. (Joint Pub 1-02)

**joint force maritime component commander.** The commander within a unified command, subordinate unified command, or joint task force responsible to the establishing commander for making recommendations on the proper employment of maritime forces and assets, planning and coordinating maritime operations, or accomplishing such operational missions as may be assigned. The joint maritime component commander is given the authority necessary to accomplish missions and tasks assigned by the establishing commander. (Joint Pub 1-02)

**logistics.** The science of planning and carrying out the movement and maintenance of forces. In its most comprehensive sense, those aspects of military operations which deal with: a. design and development, acquisition, storage, movement, distribution, maintenance, evacuation, and disposition of materiel; b. movement, evacuation, and hospitalization of personnel; c. acquisition or construction, maintenance, operation, and disposition of facilities; and d. acquisition or furnishing of services. (Joint Pub 1-02)

**littoral.** Those regions relating to or existing on a shore or coastal region, within direct control of and vulnerable to the striking power of naval expeditionary forces. (NDP 1)

**Maverick.** An air-to-surface missile with launch and leave capability. It is designed for use against stationary or moving small, hard targets such as tanks, armored vehicles, and field fortifications. (Joint Pub 1-02)

**operational control.** Transferable command authority that may be exercised by commanders at any echelon at or below the level of combatant command. Operational control is inherent in combatant command and may be delegated. Operational control includes authoritative direction over all aspects of military operations and joint training necessary to accomplish missions assigned to the command. Operational control does not in and of itself, include authoritative direction for logistics or matters of administration, discipline, internal organization, or unit training. (Joint Pub 1-02)

**sea-air-land (SEAL) team.** A naval force specially organize, trained, and equipped to conduct special operations in maritime, littoral, and riverine environments. (Joint Pub 1-02)

**Service component command.** A command consisting of the Service component commander and all those Service forces, such as individuals, units, detachments, organizations, and installations under the command, including the support forces that have been assigned to a combatant command, or further assigned to a subordinate unified command or joint task force. (Joint Pub 1-02)

**tactical control.** Command authority over assigned or attached forces or commands, or military capability or forces made available for tasking, that is limited to the detailed and, usually, local direction and control of movements or maneuvers necessary to accomplish missions or tasks assigned. Tactical control is inherent in operational control. Tactical control may be delegated to, and exercised at any level at or below the level of combatant command. (Joint Pub 1-02)

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